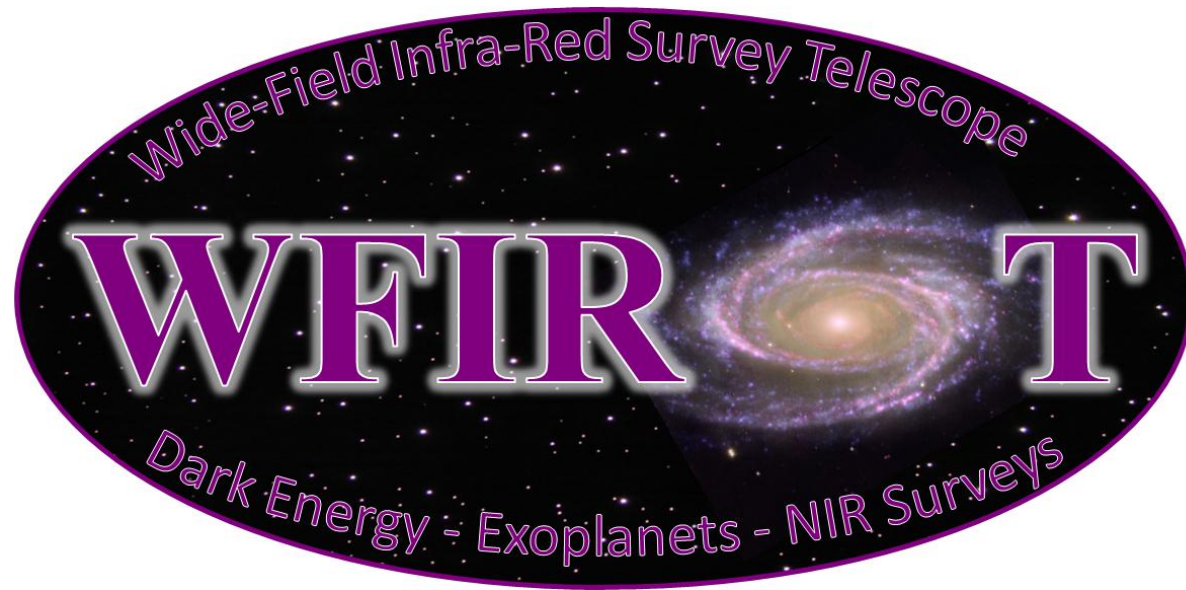


WFIRST

AFTA - Wide-Field Infrared Survey Telescope



Science Requirements Development

Jeff Kruk

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Science Requirements Document

Status

- First draft circulated 7/23/2014
- Document itself has not advanced since then, but work on content has begun on many fronts:
 - New microlensing simulation efforts begun
 - WL systematics studies begun
 - Photo-z requirements refinements & interactions w/LSST
 - Detector systematics effects, particularly correlated noise
 - GRS error budget studies begun
 - Includes assembly of new galaxy input catalogs
 - General purpose simulation tools under development
 - Near-term adaptation of existing tools
 - Long-term development of new tools

SRD status – cont.

- Coronagraph science requirements
 - Development will be less hierarchical than for the WFI
 - Science program and technology developments optimized jointly
 - Debris/dust disk simulations well under way
 - Exoplanet observation simulations begun, more on the way
 - Need process for capturing the results of the joint optimization

What inputs are needed?

- Qualitative comments on existing text
 - Are any requirements missing?
 - E.g. allowable fraction of mis-identified lines in GRS
 - Are any requirements mis-stated?
- Going beyond existing text:
 - Calibration: required data quality
 - Calibration: approaches to achieving the required quality
 - Observation strategies (often intertwined w/ calibration)
 - Develop performance requirements not covered above
 - E.g. dynamic range required in microlensing exposures, limits on allowable levels of correlated noise, etc.
- GO program requirements
 - Not supposed to be any, but knowledge may inform choices within otherwise allowable parameter ranges

When do we need them?

- Goal is complete draft by the end of March 2015.
 - This draft may have mostly TBDs at this time
 - Key point is to have identified what requirements need to be developed
 - Alerts engineers to aspects of design space that need to be explored and/or that may be constrained
 - Allows planning for resources to be allocated
- Attempt to fill in many of the TBDs by Fall 2015
 - This is still a draft! Finalization comes much later.



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Backup Slides

Science Requirements Document Status

- What's in it:
 - Science background for context
 - Objectives from Level-1
 - Flowdown from objectives to high-level science requirements
 - Flowdown from high-level science requirements to observation requirements

Science Requirements Document Status

- What's not in it yet:
 - Many intermediate steps in flowdown
 - Observatory performance requirements
 - Flowdown from observation requirements
 - *Partial draft of this section is what I circulated last Dec.*
 - Reference information
 - Traceability matrices
 - Calibration requirements flowdown
 - Everything that appears highlighted in yellow in the text
 - Etc.